n

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,683	01/21/2004	Manabu Hara	SONYJP 3.0-355	3355

530 7590 09/11/2007
LERNER, DAVID, LITTENBERG,
KRUMHOLZ & MENTLIK
600 SOUTH AVENUE WEST
WESTFIELD, NJ 07090

EXAMINER	
CUTLER, ALBERT H	
ART UNIT	**PAPER NUMBER**
2622	
MAIL DATE	**DELIVERY MODE**
09/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/761,683	HARA, MANABU	
	Examiner	Art Unit	
	Albert H. Cutler	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to communication filed on June 27, 2007.

Response to Arguments

2. Applicant's arguments filed June 27, 2007 have been fully considered but they are not persuasive.

3. Applicant argues that neither Kimura, Smith, nor Anderson discloses that a reference pixel is selected based on information concerning colors other than the defective color(s) of the defective pixel. In particular, it is noted that Kimura discloses the detection of a defective pixel using information concerning a color that is the same as a defective color of the defective pixel.

4. The Examiner acknowledges that Kimura does not explicitly teach that a reference pixel is selected. However, Kimura does teach of storing information of a plurality of colors for each pixel(column 5, line 58 through column 6, line 7). Smith on the other hand, teaches of a filter for determining a reference pixel which is most similar to a current central pixel p(c), and substituting that reference pixel for the current pixel(column 4, line 64 through column 5, line 10). A current pixel p(c) is simply changed to the value of a reference pixel if the value of p(c) is highest or lowest value in the group of pixels, without discretion as to whether or not the current pixel p(c) is actually a defective pixel. Kimura teaches of a calibration scheme using calibration sheets to determine and correct defective pixels(column 5, line 24 through column 6, line 7). Smith teaches that the reference pixel determining filter can be used purely as a noise reduction filter in imaging systems using calibration schemes(i.e. such as that of

Kumura) to correct pixel defects(column 5, lines 33-36). Smith further teaches that the live video data stream is filtered in real time. Therefore, non-defect pixels, as well as defect pixels are filtered.

5. With regards to Applicant's statement that a reference pixel is selected based on information concerning colors other than the defective color(s) of the defective pixel, the Examiner fails to see the limitation in claim 1 that the defective pixel contains other non-defective colors. Rather, claim 1, as read by the Examiner, requires a difference calculating unit for calculating differences between non-defect color information, and that said non-defect color information is among the color information of the defect pixel and the color information of pixels adjacent the defect pixel. Kimura clearly shows in figure 2 that a difference is calculated between non-defect color information(Step 3, Figure 2C), and that the non-defect color information is among color information of the defect pixel and color information of pixels adjacent the defect pixel.

6. With regards to Applicant's argument that it is noted that Kimura discloses the detection of a defective pixel using information concerning a color that is the same as a defective color of the defective pixel, the Examiner asserts that Kimura on the contrary teaches that information of at least two different colors is necessary in the proposed method for determining a defective pixel(column 5, lines 58 through column 6, line 7).

7. Applicant states that regarding pixel compensation, Kimura merely discloses that an image signal of a defective pixel is set to the average value of image signals of pixels adjacent to the defective pixel. (See e.g. Kimura col. 7, ii. 24-38; col. 8, ii. 17-27; and col. 9, ii. 9-14).

8. The Examiner acknowledges that Kimura sets a defective pixel to the average value of images signals of pixels adjacent to the defective pixel. However, Kimura teaches of calculating an average value of the differences for said reference pixel and said defect pixel, and compensating for defect color information of a defect pixel using said average value as required by claim 1. Specifically, Kimura teaches of obtaining the differences of all the pixels(Step 3, Figure 2C), which pixels would include any defect pixels and reference pixels. Kimura then teaches of calculating an average value of all of the differences(Step 4, Figure 2D), and using the average value to compensate for the defect color information of the defect pixel(The average value is used as a basis for determining defective pixels. If the value of a pixel is outside a specific range when compared to the average value, then the pixel is deemed defective, and compensated for. See Step 5, Figure 2, Figure 3A.).

9. Therefore, the rejection is maintained.

Claim Rejections - 35 USC § 103

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. Claims 1, 2, 6, 7, 8, 12, 13, 14, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura(US Patent 7,102,673) in view of Smith(US Patent 6,970,194).

12. The response by the Examiner to Applicant's arguments, as stated above, is hereby incorporated into the rejection of claims 1, 7, and 13 by reference.

Consider claim 1, Kimura teaches:

A pixel compensating circuit for compensating defect pixels(column 5, line 21 through column 9, line 48) comprising:

a color information holding unit for holding plural kinds of color information of a defect pixel and pixels adjacent said defect pixel(Multiple image signals are obtained(i.e. they are held in a holding unit), each signal corresponding to a different calibration sheet, which calibration sheets can correspond to different colors, and differences between the signals are examined to find defective pixels(column 5, line 24 through column 6, line 7). Since entire images are read out, corresponding to different color sheets, information representing plural kinds color information for defect pixels as well as non-defective pixels(i.e. adjacent pixels) is held.);

a difference calculating unit for calculating differences between non-defect color information among said color information of said defect pixel and said color information of said pixels adjacent said defect pixel corresponding to said non-defect color information(See figure 2, column 6, line 19 through column 7, line 14. Multiple calibration sheets can be used(column 5, line 54), and these sheets can be comprised of different colors. However, the difference between the output from every set of two calibration sheets is obtained(column 6, line 5). Therefore, during the readout of an image signal, zero defect color information is obtained at the same time as the defect

color information(i.e. the zero defect color information is **among** the defect information produced by the defective pixel). Differences are obtained between successive image readouts using different color sheets. Therefore differences between zero defect color information, which is among said color information of said defect pixel, and color information of said pixels adjacent said defect pixel, pixels which correspond to zero defect color information, are obtained when comparing two separate images. Because all the pixels are compared, differences for the defect pixels, as well as differences for the adjacent pixels are obtained. The differences between the images are obtained, as shown in figure 2c, in order to find defective pixels.); and

a compensating unit for calculating an average value of said differences for said reference pixel and said defect pixel(In Step 4, of figure 2, the average values of **all** the differences(i.e. the differences for reference pixels, defects pixels, and any other pixels) are obtained. See column 6, lines 16-22.), and for compensating defect color information of said defect pixel using said average value(The average values are used to determine defective pixels(Step 5, figure 2, column 6, lines 23-45). Any defective pixel is then compensated by replacing its value with the average value of the surrounding pixels(column 7, lines 34-37).).

However, Kimura does not explicitly teach that the pixel compensation is performed on a video signal, or of a reference pixel determining unit for determining a reference pixel having color information that is the most similar to said non-defect color information.

Smith is similar to Kimura in that Smith is concerned with correcting defective pixels output from an imaging device(column 1, lines 64-67). Smith is also similar in that color and monochrome images can be used(column 2, lines 1-3).

In addition to the teachings of Kimura, Smith teaches that the pixel compensation is performed on a video signal(column 1, lines 64-67), and of a reference pixel determining unit for determining a reference pixel having color information that is the most similar to said non-defect color information(See column 4, line 25 through column 5, line 9. A possible defective pixel p(c) is compared to all eight neighboring pixels. If the value of pixel p(c) is larger than the largest neighboring value, then p(c) is set to the largest value(i.e. the largest value pixel is most similar to p(c), and is thus set as the reference pixel). If p(c) is smaller than the smallest value, then p(c) is set to the smallest value(i.e. the smallest value pixel is most similar to p(c), and is thus set as the reference pixel).).

Therefore, it would have been obvious to a person having ordinary skill in that art at the time of the invention to include a reference pixel determining unit for determining a reference pixel that is the most similar to said non-defect color information in a video signal as taught by Smith in the pixel compensating circuit taught by Kimura for the benefit of avoiding unwanted costs by easily determining a replacement pixel for a defective pixel, and allowing subsequent calibration, beneficial due to the transient nature of pixel defects(Smith, column 1, lines 50-60).

Consider claim 2, and as applied to claim 1 above, Kimura does not explicitly teach that said reference pixel determining unit determines said reference pixel so that the sum of the absolute values of said differences becomes a minimum.

However, Smith teaches that said reference pixel determining unit(see claim 1 rationale) determines said reference pixel so that the sum of the absolute values of said differences becomes a minimum(When the largest value pixel is set as the reference pixel, as explained in claim 1 above, the sum of the absolute values of the differences of the pixels of Kimura becomes a minimum, as the difference between the upper and lower values of the previously defective pixel are smaller due to the lowering of the upper value to the reference pixel value.).

Consider claim 6, and as applied to claim 1 above, Kimura teaches that the image signal is output from a solid state device(column 1, lines 9-14).

However, Kimura does not explicitly teach that the image signal is a video signal. Smith teaches that the image signal is a video signal("video data stream", column 1, line 67).

Consider claim 7, Kimura teaches:

A pixel compensating method for compensating a defect pixel of an image signal(column 5, line 21 through column 9, line 48), comprising the steps of:

holding plural kinds of color information of defect pixel and pixels adjacent said defect pixel(Multiple image signals are obtained(i.e. they are held in a holding unit),

each signal corresponding to a different calibration sheet, which calibration sheets can correspond to different colors, and differences between the signals are examined to find defective pixels(column 5, line 24 through column 6, line 7). Since entire images are read out, corresponding to different color sheets, information representing plural kinds color information for defect pixels as well as non-defective pixels(i.e. adjacent pixels) is held.);

calculating differences between non-defect color information among said color information of said defect pixel and said color information of said pixels adjacent said defect pixel corresponding to said non-defect color information(See figure 2, column 6, line 19 through column 7, line 14. Multiple calibration sheets can be used(column 5, line 54), and these sheets can be comprised of different colors. However, the difference between the output from every set of two calibration sheets is obtained(column 6, line 5). Therefore, during the readout of an image signal, zero defect color information is obtained at the same time as the defect color information(i.e. the zero defect color information is **among** the defect information produced by the defective pixel). Differences are obtained between successive image readouts using different color sheets. Therefore differences between zero defect color information, which is among said color information of said defect pixel, and color information of said pixels adjacent said defect pixel, pixels which correspond to zero defect color information, are obtained when comparing two separate images. Because all the pixels are compared, differences for the defect pixels, as well as differences for the adjacent pixels are

obtained. The differences between the images are obtained, as shown in figure 2c, in order to find defective pixels.);

calculating an average value of said differences for said reference pixel and said defect pixel(In Step 4, of figure 2, the average values of **all** the differences(i.e. the differences for reference pixels, defects pixels, and any other pixels) are obtained. See column 6, lines 16-22.); and

compensating defect color information of said defect pixel using said average value(The average values are used to determine defective pixels(Step 5, figure 2, column 6, lines 23-45). Any defective pixel is then compensated by replacing its value with the average value of the surrounding pixels(column 7, lines 34-37).).

However, Kimura does not explicitly teach that the image signal is a video signal, or determining a reference pixel having color information that is the most similar to said non-defect color information;

Smith is similar to Kimura in that Smith is concerned with correcting defective pixels output from an imaging device(column 1, lines 64-67). Smith is also similar in that color and monochrome images can be used(column 2, lines 1-3).

In addition to the teachings of Kimura, Smith teaches that the pixel compensation is performed on a video signal(column 1, lines 64-67), and of a reference pixel determining unit for determining a reference pixel having color information that is the most similar to said non-defect color information(See column 4, line 25 through column 5, line 9. A possible defective pixel p(c) is compared to all eight neighboring pixels. If the value of pixel p(c) is larger than the largest neighboring value, then p(c) is set to the

largest value(i.e. the largest value pixel is most similar to p(c), and is thus set as the reference pixel). If p(c) is smaller than the smallest value, then p(c) is set to the smallest value(i.e. the smallest value pixel is most similar to p(c), and is thus set as the reference pixel).).

Therefore, it would have been obvious to a person having ordinary skill in that art at the time of the invention to include a reference pixel determining unit for determining a reference pixel that is the most similar to said non-defect color information in a video signal as taught by Smith in the pixel compensating circuit taught by Kimura for the benefit of avoiding unwanted costs by easily determining a replacement pixel for a defective pixel, and allowing subsequent calibration, beneficial due to the transient nature of pixel defects(Smith, column 1, lines 50-60).

Consider claim 8, and as applied to claim 7 above, Kimura does not explicitly teach that said reference pixel is determined so that the sum of the absolute values of said differences becomes a minimum.

However, Smith teaches that said reference pixel determining unit(see claim 1 rationale) determines said reference pixel so that the sum of the absolute values of said differences becomes a minimum(When the largest value pixel is set as the reference pixel, as explained in claim 1 above, the sum of the absolute values of the differences of the pixels of Kimura becomes a minimum, as the difference between the upper and lower values of the previously defective pixel are smaller due to the lowering of the upper value to the reference pixel value.).

Consider claim 12, and as applied to claim 7 above, Kimura teaches that the image signal is output from a solid state device(column 1, lines 9-14).

However, Kimura does not explicitly teach that the image signal is a video signal. Smith teaches that the image signal is a video signal("video data stream", column 1, line 67).

Consider claim 13, Kimura teaches:

An image taking apparatus(column 1, lines 6-14) including a pixel compensating circuit for compensating defect pixels included in an image signal(column 5, line 21 through column 9, line 48), wherein said pixel compensating circuit comprising:

a color information holding unit for holding plural kinds of color information of a defect pixel and pixels adjacent said defect pixel(Multiple image signals are obtained(i.e. they are held in a holding unit), each signal corresponding to a different calibration sheet, which calibration sheets can correspond to different colors, and differences between the signals are examined to find defective pixels(column 5, line 24 through column 6, line 7). Since entire images are read out, corresponding to different color sheets, information representing plural kinds color information for defect pixels as well as non-defective pixels(i.e. adjacent pixels) is held.);

a difference calculating unit for calculating differences between non-defect color information among said color information of said defect pixel and said color information of said pixels adjacent said defect pixel corresponding to said non-defect color

information(See figure 2, column 6, line 19 through column 7, line 14. Multiple calibration sheets can be used(column 5, line 54), and these sheets can be comprised of different colors. However, the difference between the output from every set of two calibration sheets is obtained(column 6, line 5). Therefore, during the readout of an image signal, zero defect color information is obtained at the same time as the defect color information(i.e. the zero defect color information is **among** the defect information produced by the defective pixel). Differences are obtained between successive image readouts using different color sheets. Therefore differences between zero defect color information, which is among said color information of said defect pixel, and color information of said pixels adjacent said defect pixel, pixels which correspond to zero defect color information, are obtained when comparing two separate images. Because all the pixels are compared, differences for the defect pixels, as well as differences for the adjacent pixels are obtained. The differences between the images are obtained, as shown in figure 2c, in order to find defective pixels.); and

a compensating unit for calculating average values of said differences for said reference pixel and said defect pixel(In Step 4, of figure 2, the average values of **all** the differences(i.e. the differences for reference pixels, defects pixels, and any other pixels) are obtained. See column 6, lines 16-22.), and for compensating defect color information of said defect pixel using said average value(The average values are used to determine defective pixels(Step 5, figure 2, column 6, lines 23-45). Any defective pixel is then compensated by replacing its value with the average value of the surrounding pixels(column 7, lines 34-37).).

However, Kimura does not explicitly teach that the pixel compensation is performed on a video signal, or of a reference pixel determining unit for determining a reference pixel having color information that is the most similar to said non-defect color information.

Smith is similar to Kimura in that Smith is concerned with correcting defective pixels output from an imaging device(column 1, lines 64-67). Smith is also similar in that color and monochrome images can be used(column 2, lines 1-3).

In addition to the teachings of Kimura, Smith teaches that the pixel compensation is performed on a video signal(column 1, lines 64-67), and of a reference pixel determining unit for determining a reference pixel having color information that is the most similar to said non-defect color information(See column 4, line 25 through column 5, line 9. A possible defective pixel p(c) is compared to all eight neighboring pixels. If the value of pixel p(c) is larger than the largest neighboring value, then p(c) is set to the largest value(i.e. the largest value pixel is most similar to p(c), and is thus set as the reference pixel). If p(c) is smaller than the smallest value, then p(c) is set to the smallest value(i.e. the smallest value pixel is most similar to p(c), and is thus set as the reference pixel).).

Therefore, it would have been obvious to a person having ordinary skill in that art at the time of the invention to include a reference pixel determining unit for determining a reference pixel that is the most similar to said non-defect color information in a video signal as taught by Smith in the pixel compensating circuit taught by Kimura for the benefit of avoiding unwanted costs by easily determining a replacement pixel for a

defective pixel, and allowing subsequent calibration, beneficial due to the transient nature of pixel defects(Smith, column 1, lines 50-60).

Consider claim 14, and as applied to claim 13 above, Kimura does not explicitly teach that said reference pixel determining unit determines said reference pixel so that the sum of the absolute values of said differences becomes a minimum.

However, Smith teaches that said reference pixel determining unit(see claim 1 rationale) determines said reference pixel so that the sum of the absolute values of said differences becomes a minimum(When the largest value pixel is set as the reference pixel, as explained in claim 1 above, the sum of the absolute values of the differences of the pixels of Kimura becomes a minimum, as the difference between the upper and lower values of the previously defective pixel are smaller due to the lowering of the upper value to the reference pixel value.).

Consider claim 18, and as applied to claim 13 above, Kimura teaches that the image signal is output from a solid state device(column 1, lines 9-14).

However, Kimura does not explicitly teach that the image signal is a video signal. Smith teaches that the image signal is a video signal("video data stream", column 1, line 67).

13. Claims 3, 4, 5, 9, 10, 11, 15, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura in view of Smith as applied to claims 1, 7, and 13

above, and further in view of Anderson et al.(US Patent Application Publication 2004/0096125).

Consider claim 3, and as applied to claim 1 above, the combination of Kimura and Smith does not explicitly teach that when there exists a defect in the adjacent pixel, said adjacent pixel having defect is excluded.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach that when there exists a defect in the adjacent pixel, said adjacent pixel having defect is excluded(See figure 5A, paragraphs 0043-0059, Anderson et al. teach of using a series of masks to exclude adjacent defective pixels.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to exclude adjacent defective pixels as taught by Anderson et al., when correcting a defective pixel as taught by the combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Consider claim 4, and as applied to claim 1 above, the combination of Kimura and Smith teaches of performing compensation for defective pixels(see claim 1 rationale). However, the combination does not explicitly teach that said compensation is carried out per one pixel when said defect pixels are 2 or more in a row.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach that said compensation is carried out per one pixel when said defect pixels are 2 or more in a row(See figure 5A, paragraphs 0043-0059, Anderson et al. teach of using a series of masks to exclude adjacent defective pixels. In this way, correct compensation can be achieved on a single pixel, indicated by the letter X.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to perform compensation per one pixel when said defect pixels are 2 or more in a row as taught by Anderson et al., when correcting a defective pixel as taught by the combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Consider claim 5, and as applied to claim 1 above, the combination of Kimura and Smith teaches of determining differences between pixel values(see claim 1 rationale). However, the combination does not explicitly teach of a weighting unit for applying a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach of a weighting unit for applying a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel(See paragraphs 0023-0042, figures 1-4g).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a weighting unit for applying a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel as taught by Anderson et al., when correcting a defective pixel as taught by the combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Consider claim 9, and as applied to claim 7 above, the combination of Kimura and Smith does not explicitly teach that when there exists a defect in the adjacent pixel, said adjacent pixel having defect is excluded.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach that when there exists a defect in the adjacent pixel, said adjacent pixel having defect is excluded(See figure 5A, paragraphs 0043-0059, Anderson et al. teach of using a series of masks to exclude adjacent defective pixels.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to exclude adjacent defective pixels as taught by Anderson

et al., when correcting a defective pixel as taught by the combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Consider claim 10, and as applied to claim 7 above, the combination of Kimura and Smith teaches of performing compensation for defective pixels(see claim 1 rationale). However, the combination does not explicitly teach that said compensation is carried out per one pixel when said defect pixels are 2 or more in a row.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach that said compensation is carried out per one pixel when said defect pixels are 2 or more in a row(See figure 5A, paragraphs 0043-0059, Anderson et al. teach of using a series of masks to exclude adjacent defective pixels. In this way, correct compensation can be achieved on a single pixel, indicated by the letter X.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to perform compensation per one pixel when said defect pixels are 2 or more in a row as taught by Anderson et al., when correcting a defective pixel as taught by the combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Consider claim 11, and as applied to claim 7 above, the combination of Kimura and Smith teaches of determining differences between pixel values(see claim 1 rationale). However, the combination does not explicitly teach of applying a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach of applying a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel(See paragraphs 0023-0042, figures 1-4g).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to apply a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel as taught by Anderson et al., when correcting a defective pixel as taught by the combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Consider claim 15, and as applied to claim 13 above, the combination of Kimura and Smith does not explicitly teach that when there exists a defect in the adjacent pixel, said adjacent pixel having defect is excluded.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach that when there exists a defect in the adjacent pixel, said adjacent pixel having defect is excluded(See figure 5A, paragraphs 0043-0059, Anderson et al. teach of using a series of masks to exclude adjacent defective pixels.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to exclude adjacent defective pixels as taught by Anderson et al., when correcting a defective pixel as taught by the combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Consider claim 16, and as applied to claim 13 above, the combination of Kimura and Smith teaches of performing compensation for defective pixels(see claim 1 rationale). However, the combination does not explicitly teach that said compensation is carried out per one pixel when said defect pixels are 2 or more in a row.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach that said compensation is carried out per one pixel when said defect pixels are 2 or more in a row(See figure 5A, paragraphs 0043-0059, Anderson et al. teach of using a series of masks to exclude adjacent defective pixels. In this way, correct compensation can be achieved on a single pixel, indicated by the letter X.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to perform compensation per one pixel when said defect pixels are 2 or more in a row as taught by Anderson et al., when correcting a defective pixel as taught by the combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Consider claim 17, and as applied to claim 13 above, the combination of Kimura and Smith teaches of determining differences between pixel values(see claim 1 rationale). However, the combination does not explicitly teach of a weighting unit for applying a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel.

Anderson et al. is similar to both Kimura and Smith in that Anderson et al. is concerned with replacing defective pixels in image sensing elements(paragraph 0002).

However, in addition to the teachings of Kimura and Smith, Anderson et al. teach of a weighting unit for applying a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel(See paragraphs 0023-0042, figures 1-4g).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a weighting unit for applying a coefficient to said difference depending on a distance between said defect pixel and the focused adjacent pixel as taught by Anderson et al., when correcting a defective pixel as taught by the

combination of Kimura and Smith in order to prevent the loss of image information and maintain the desired aesthetic quality of the imagery(Anderson et al., paragraph 0005).

Conclusion

14. Any objections made by the Examiner to the claims are hereby withdrawn in view of Applicant's response.

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

NGOC-YEN VU
SUPERVISORY PATENT EXAMINER